

GMP

GENERAL
MICROTECHNOLOGY
& PHOTONICS

MAGELLAN^ε

NANOPARTICLE TRACE CHARACTERIZATION IN WATER

*The ultimate nanoparticle analyzer
for water characterization*



Push your analysis few steps further !

IDEAL FOR

Online monitoring of water treatment
Membrane integrity monitoring
Ultrapure water monitoring
Water quality insurance
Filtration processes
Pollution detection
... and more



Enlight the Nanoworld



- Unique patented technology
- Nanoparticle size and concentration analysis
- Trace analysis down to ppt (ng/L)

Breakthrough technology inside

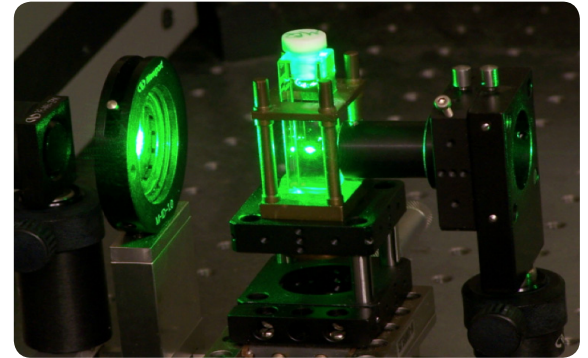
MAGELLAN^ε is a unique **nanoparticle analyzer** based on a patented breakthrough technique called **Laser Induced Breakdown Detection (LIBD)**. **MAGELLAN^ε** measures **size distribution and concentration** of **nanoparticle** traces in water with an unprecedented sensitivity and resolution.

MAGELLAN^ε is the result of a successful joint development between CORDOUAN Technologies and the **Karlsruhe Institute of Technology (KIT)** in Germany.

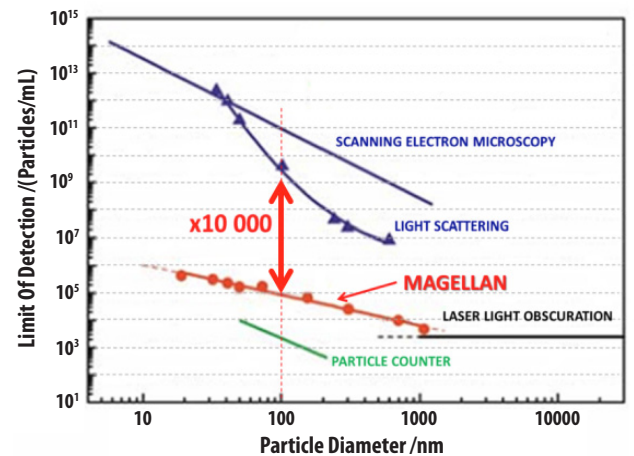
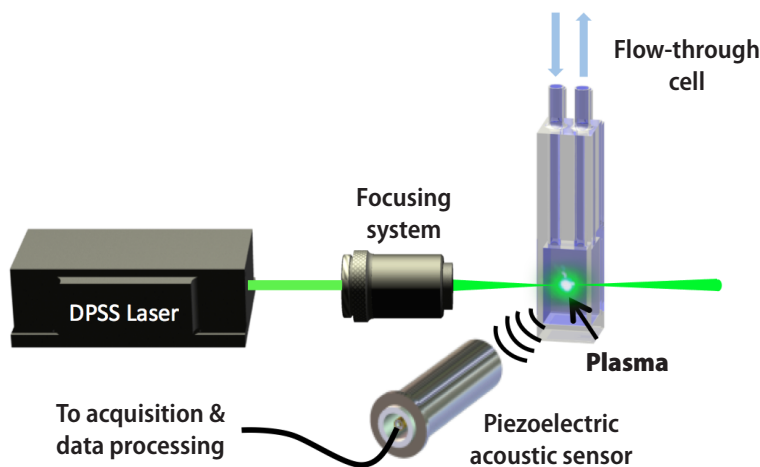
LIBD Principle

LIBD is a field proven technology issued from more than 20 years of research in KIT-INE; basically, a nanosecond pulsed laser is focused into a liquid containing nanoparticles to be detected. Each time a particle crosses the laser beam, a plasma effect is created and detected by an acoustic wave sensor.

Size distribution and concentration are then deduced from the plasma statistic by the use of an advanced proprietary algorithm and calibration data.



[Download technical notes www.cordouan-tech.com](http://www.cordouan-tech.com)



- Broadest particle size measurement
- Sensitivity: more than 10 000 times superior to conventional light scattering techniques

Unprecedented performances, Unequaled sensitivity & resolution

Particle size

Particle concentration

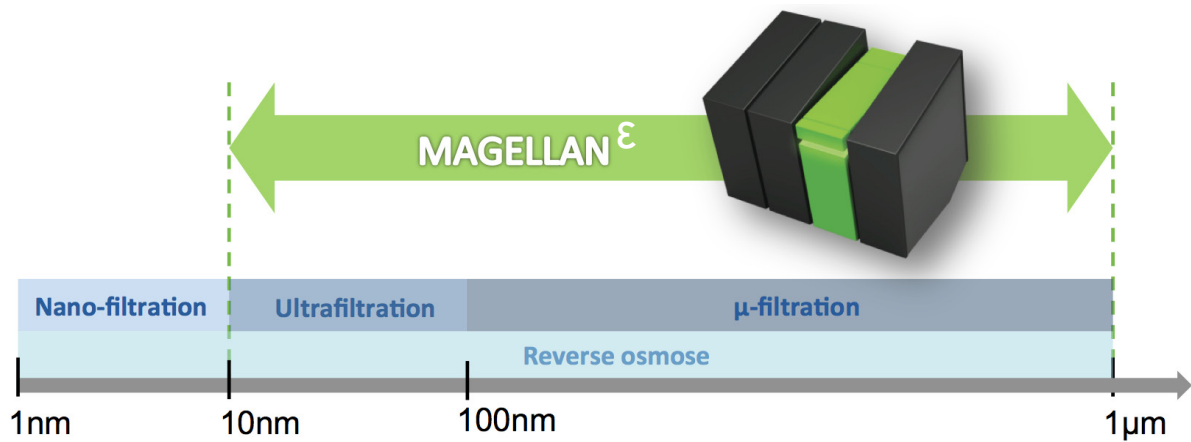
On-line particle measurement



Nanoparticle trace characterization in water

Magellan's Key benefit

- ✓ Number density : as low as 10^4 particles/mL
- ✓ High size resolution through 8 channels
- ✓ Compact and robust design : transportable and operation in all environments
- ✓ Versatile and easy to use :
 - Variable flow rate
 - No sample preparation required
 - Limited maintenance (highly reliable design)
- ✓ Broadest particle size range : from 10 nm to $1\mu\text{m}$
- ✓ Unequaled sensitivity : down to ng/L (ppt) range
- In line and under pressure measurements (up to 60 bars)
- Advanced Proprietary algorithm for accurate results
- Various sample cell configurations: static or flow-through cell



Targeted applications

Drinking and industrial water quality insurance



Membrane integrity online monitoring (fouling & breakthrough)



Pollution detection of natural water resources

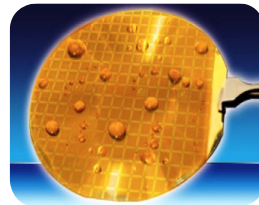


Push your analysis few steps further

Colloids in primary coolant of nuclear reactor system characterization



Ultrapure water monitoring for semiconductor industry



MAGELLAN^ε

Nanoparticle trace characterization in water

Specifications

Particle size range	10 – 1000 nm (Up to 8 channels)
Concentration range	10 ⁴ to 10 ¹¹ part/ml (Typically 10 ppt with 20nm particles)
Accuracy	+/-10% (depending on measurement time)
Calibration	Certified reference materials polystyrene (NIST) or customer reference
Sample preparation	None – Standard laboratory practices for ultra-trace sample analysis
Standard sample cell configuration	Static cell : 3.5ml / Flow-through cell: up to 5 bars – 275µL - 4 mL/min (pump depending)
On demand sample cell configuration	In situ / High pressure cell: up to 60 bars - 4 mL/min

Signal processing

Measurement technology	Laser Induced Breakdown Detection (LIBD)
Laser source	DPSS - Power <50mW - Pulsed laser 100 Hz – TEM00 - @532 nm – Lifetime 2 Giga shots
Data processing algorithm	Proprietary algorithm software developed with KIT : ASTROLIBD [®]
Detector	Piezoelectric acoustic wave sensor (Patented)

General

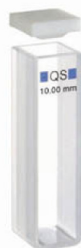
Operating conditions / Storage conditions	5°C to 40°C / -10°C to 50°C – Relative humidity < 70% non condensing
Computer interface	USB 2.0 – RJ45 – Serial Port - Windows 7 professional – 64-bit
Dimensions	40 cm x 30 cm x 40 cm (HWD)
Weight	Analyzer < 25 kg / Computer < 10kg
Power	100-240 VAC, 50-60 Hz, 10A max

System Compliance

CE certification	CE marked product - Class I laser product, EN 60825-1:2001, CDRH
Ingress Protection (IP)	Housing IP54, Optics IP65 – (protection from dust and water)



Flow-through cell



Standard static cell

The **MAGELLAN** analyzer and its components are protected by:
German Patents No.: DE 19833339C1
 DE 19602048C2, DE 102006051227B9;
European Patent No.: EP 1 918 694 A1;
Worldwide Patent No.: WO 0006993A1;
 other patent pending.

